CLAIMS

1. An improved second stage breathing regulator for divers, the regulator having a demand valve to be connected to a source of pressurized air and a pressure-activated device for opening the demand valve to direct air into the regulator and to a mouthpiece tube to be held in the mouth by a diver, the regulator of the type wherein changes in the direction of air flow out of an air exit within the regulator produces a variation in venturi effect from small to large to progressively reduce the breathing effort required to keep open the demand valve; the improvement comprising:

a deflector member located within said regulator for movement relative to said air exit for redirecting said air flow relative to said mouthpiece tube for changing said venturi effect; and

means for controlling the movement of said deflector member in response to the ambient water pressure surrounding said regulator.

2. The improvement recited in claim 1 wherein said movement controlling means comprises a piston having a piston head and a piston rod, the piston head separating two respectively isolated chambers including a first chamber having ambient water pressure therein and a second chamber having surface water pressure therein; the relative difference in the pressures in said first and second chambers determining the position of said piston.

3. The improvement recited in claim 2 wherein said deflector member comprises a distal end of said piston rod.

4. The improvement recited in claim 2 wherein said movement controlling means further comprises a compression spring located for resisting the movement of said piston rod toward said air exit.

5. The improvement recited in claim 2 further comprising an O-ring positioned annularly around said piston head for isolating the first and second chambers from one another.

6. The improvement recited in claim 1 wherein said movement controlling means comprises a piston having a rod portion and a head portion; the head portion providing a movable sealing surface between a first chamber at ambient water pressure and a second chamber at a selected constant water pressure, said rod portion having a distal end terminating in said deflector member, whereby increasing ambient water pressure forces said piston to move said deflector member toward said air exit.

7. The improvement recited in claim 1, said regulator having a first chamber open to ambient water pressure and a second chamber having an initially selected pressure therein, said means comprising a piston having a sealing head separating said first and second chambers and said piston also having a rod terminating in said deflector member; said piston being forced to move in accordance with the pressure difference between said first and second chambers.

8. The improvement recited in claim 7 further comprises a spring positioned relative to said piston rod to add resistance to movement of said deflector member toward said air exit whereby tending to return said deflector member to a stable position of minimum venturi effect.

9. The improvement recited in claim 7 further comprising at least one O-ring for isolating said first chamber from said second chamber.

10. The improvement recited in claim 7 further comprising at least one O-ring for isolating said second chamber from said deflector member.